A hybrid microfluidic platform for energy harvesting based on piezoelectricity and reverse electrowetting for wearable biosensors

Conference or Workshop Item

TIME ZONE = BST

26th July 2021
Summer School (additional registration fee)

09:45-11:30	**Biosensors 2020 Summer School: Commercialising Biosensors | Introduction, Welcome & Session 1** (Man Bock Gu, Anthony Turner and Martin Peacock) CASE HISTORIES – Success, failure and lessons learnt. (Chair: Martin Peacock) Each speaker will outline selected successes and failures with a reflection on lessons learnt. 10.00 – 10.30 Martin Peacock (Zimmer and Peacock, UK) The good, the bad and the ugly - a life in business. 10.30 - 11.00 Nancy Allbritton (University of Washington, USA) Persistence pays - A tale of four biotech start-ups. 11.00 – 11.30 Surendar Magar (President and CEO, LifeSignals, Inc., USA) Challenges facing a start-up targeting wireless biosensors for mass markets.
11:30-11:45	**Break**
11:45-13:45	11.45 - 12.15 Frances Ligler (University of North Carolina at Chapel Hill and North Carolina State University, USA) The path to license: How to commercialize your inventions without being an entrepreneur. 12.15 – 12.45 Menno Prins (Eindhoven University of Technology, The Netherlands) Heli Biomonitoring – a journey in continuous sensing. 12.45 – 13.15 Koji Sode (Ultizyme International Ltd., Japan & University of North Carolina at Chapel Hill and North Carolina State University, USA) Rewards and drawbacks of being engaged in the R&D of blood glucose monitoring, the largest market in the biosensor industry. 13.15 – 13.45 George Ligler (University of North Carolina at Chapel Hill and North Carolina State University, USA) To publish or patent—or both, or neither.
13:45-14:15	**Break**
14:15-15:45	**Breakout sessions led by each of the speakers via zoom**
15:45-16:00	**Break**
16:00-17:10	**Chaired panel discussion & Wrap-up and farewell** Chair: Anthony Turner Martin Peacock, Nancy Allbritton, Surendar Magar, Frances Ligler, Menno Prins, Koji Sode, George Ligler. The panel will discuss question from the chair together with questions from the audience including the broad areas of: • How best to protect your technology? • Choosing whether to start a company or to license technology. • How to sell your technology. • Making a success of a start-up.

27th July 2021
MAIN CONGRESS

08:00-08:30

Welcome and introduction to the congress
Anthony P.F. Turner and Man Bock Gu and the Congress Committee

08:30-09:50

Plenary session 1
Session Chairs: Man Bock Gu and Anthony P.F. Turner

The Anthony and Alice Turner Endowed Lecture
08:30-09:10 [PLN01]
Unconventional bioelectronics for heart and brain diseases
Dae-Hyeong. Kim, *Seoul National University, Republic of Korea*

09:10-09:50 [PLN02]
Label-free organic bioelectronic analytical sensors: A new trend in single-molecule detection
Luisa Torsi
University of Bari, Italy

09:50-10:15

Networking in the Lounge

10:15-11:45

Stream 1A - DNA- and nucleic acid-based sensors and aptasensors

Session Chairs: Hyun Gyu Park & Wing Cheung Mak

10:15-10:30 [O1A.01]
A 10-minute universal cancer test based on interfacial biosensing
A. Ali Ibn Sina, L. G. Carrascosa, M. Trau
The University of Queensland, Australia

10:30-10:45 [O1A.02]
LAPS modified with various aptamers for simultaneous detection of multiple marine toxins
Y.L. Tian[1], P. Zhu[1], Y.T. Chen[1], L.P. Du[1], W. Chen[1], C.S. Wu[1], P. Wang[2]
[1]*Xi'an Jiaotong University, China.* [2]*Zhejiang University, China*

10:45-11:00 [O1A.03]
Dual-reporting DNA nanosensor with exceptionally broad detection range
B. Kang[1], S.V. Park[1], H.S. Tom[2], S.S. Oh[1]
[1]*Pohang University of Science and Technology (POSTECH), Republic of Korea.* [2]*Stanford University, USA*

11:00-11:15 [O1A.04]
An electrochemical biosensor using aflatoxin G1 aptamer developed by a newly modified GO-SELEX

Stream 2A - Smartphone diagnostics, wearable biosensors and mobile health

Session Chairs: Dae-Hyeong Kim & Mun'delanji C. Vestergaard

10:15-10:30 [O2A.01]
Lubricin (PRG4): A versatile protein for electrochemical sensing
S. M. Silva[1], M. Russo[2], A. F. Quigley[3], R. M. I. Kapsa[4], G. W. Greene[2], S. E. Moulton[1]
[1]*Swinburne University of Technology, Australia.* [2]*Deakin University, Australia.* [3]*Royal Melbourne Institute of Technology, Australia.* [4]*University of Wollongong, Australia*

10:30-10:45 [O2A.02]
Instrument-free voltammetry using a mobile phone
C.F. Hogan, D. Elton, P. O'Conghaile
La Trobe University, Australia

10:45-11:00 [O2A.03]
Direct electron transfer type L-lactate sensor for wearable multiplexed biosensor system toward continuous monitoring of metabolites in sweat
K. Hiraka[1], S. Motohashi[1], W. Tsugawa[1], R. Asano[1], M.A. Yokus[2], K. Ikebukuro[1], M.A. Daniele[2,3], K. Sode[3,2]
[1]*Tokyo University of Agriculture and Technology, Japan.* [2]*North Carolina State*

Stream 3A - Single molecule detection

Session Chairs: Hans H. Gorris & Hatice Altug

10:15-10:45 [KEYNOTE 3A]
Continuous biomarker monitoring with single-molecule resolution: Principles, proof of concept, and applications
M.W.J. Prins
Eindhoven University of Technology & Helia Biomonitoring, The Netherlands

10:45-11:00 [O3A.01]
Aptamer-functionalized solid-state nanopore for the specific detection of proteins
L. Reynaud[1], A. Bouchet-Spinelli[1], J-M. Janot[2], A. Buhot[1], S. Balme[2], C. Raillon[1]
[1]*Univ. Grenoble Alpes, CEA, CNRS, IRIG-SyMMES, France.* [2]*IEM Montpellier, France*

11:00-11:15 [O3A.02]
A digital single-molecule nanopillar SERS platform for predicting and monitoring immune toxicities in immunotherapy
A. Wuethrich[1], J. Li[1], A. I. Sina[1], H.H. Cheng[1], Y. Wang[2], A. Behren[3], P. N. Mainwaring[1], M. Trau[1]
[1]*The University of Queensland, Australia.* [2]*Macquarie University, Australia.* [3]*Oliva Newton-John Cancer Research Institute, Australia*

11:15-11:30 [O3A.03]

Stream 4A - Lab-on-a-chip and multiplexed sensors

Session Chairs: Xian-En Zhang & Danila Moscone

10:15-10:30 [O4A.01]
Automated optofluidic system for Type-I diabetes screening
C. S. Huertas[1], C. Szydzik[1,2], V. Bansal[1], A. Hardikar[3], A. Mitchell[1]
[1]*RMIT University, Australia.* [2]*Monash University, Australia.* [3]*University of Sydney, Australia*

10:30-10:45 [O4A.02]
Ultra-sensitive and reusable graphene oxide-modified double interdigitated capacitive (DIDC) sensing chip for detecting SARS-CoV-2
P.K. Sharma[1,2], E.S. Kim[1,2], S. Mishra[3], E. Ganbold[1], Ryun-Sang Seong[1], A. Kaushik[4], N.Y. Kim[1,2]
[1]*RFIC Centre, Kwangwoon University, Republic of Korea.* [2]*Kwangwoon University, Republic of Korea.* [3]*NDAC Centre, Kwangwoon University, Republic of Korea.* [4]*Florida Polytechnic University, USA*

10:45-11:00 [O4A.03]
Selective isolation of EMT-related exosome by using a fully-integrated microfluidic device
H.G. Gwak, S.Y. Park, J.M. Kim, J.D. Lee, S.I. Kim, K.A. Hyun, H.I. Jung
Yonsei University, Republic of Korea

	T.T.T. Tran, M.B. Gu *Korea University, Republic of Korea* **11:15-11:30 [O1A.05]** **A mini potentiostat-based portable electrochemical sandwich-type aptasensor for the early diagnosis of periodontitis** B.H. Lee, C.M. Joe, S.H. Kim, M.B. Gu *Korea University, Republic of Korea*	*University, USA.* [3]*University of North Carolina at Chapel Hill, USA* **11:00-11:15 [O2A.04]** **Mouthguard glucose sensor with Prussian blue as an electron-transfer mediator for reduction of influence of salivary contaminants** T. Arakawa, Z. Zhang, K. Tomoto, K. Toma, K. Mitsubayashi *Tokyo Medical and Dental University, Japan* **11:15-11:30 [O2A.05]** **A flexible polyaniline biosensor array for multi-channel cardiovascular health monitoring** V.P. Rachim, S. Kang, J.H. Baek, S.M. Park *Pohang University of Science and Technology, Republic of Korea* **11:30-11:45 [O2A.06]** **Surface resonance based RF sensor for glucose mapping in aqueous solutions** J. Malik[1,2], F. Bien[1,2] [1]*SB-Solutions Inc., Republic of Korea.* [2]*Ulsan National Institute of Science and Technology, Republic of Korea*	**Single-molecule detection of DNA and proteins in a plasmonic nanopore by Surface Enhanced Raman Spectroscopy (SERS)** J-A. Huang *University of Oulu, Finland* **11:30-11:45 [O3A.04]** **Massively parallel single molecule counting for quantitative biosensing using dark-field imaging of plasmonic nanoparticles** P. Bakthavathsalam, D. Bennett, M. Sriram, B. Markhali, G. Walker, S. Stelzer-Braid, W. Rawlinson, R.D. Tilley, J.J. Gooding *UNSW Australia, Australia*	**11:00-11:15 [O4A.04]** **Wide-field imaging system for digital CFU assay through 10-million droplet analysis** S. Ki, D. Kang *Incheon National University, Republic of Korea* **11:15-11:30 [O4A.05]** **A manual centrifuge and paper devices for point-of-care diagnosis** J.E. Lee, Y. Hao, H.P. Wang, Z.S. Dong, S.J. Chen, C.F. Chen *National Taiwan University, Taiwan* **11:30-11:45 [O4A.06]** **Controlled integration of inhalation exposure system for reconstituting lung physiological functions on a chip** K.C. Lin, J.W. Yang, C.Z. Yen, G.Y. Chen *National Chiao Tung University, Taiwan*
11:45-12:15	**Networking in the Lounge**			
12:15-13:45	**Stream 1B - DNA- and nucleic acid-based sensors and aptasensors** **Session Chairs: Luisa Torsi & Nako Nakatsuka** **12:15-12:30 [O1B.01]** **Ultrasensitive plasmonic detection of circulating microRNAs using horizontally tethered PNA probes** R. D'Agata[1,2], N. Bellassai[1], M.C. Giuffrida[3], A. Rozzi[4], A. Finotti[5], G. Gasparello[5], R. Corradini[4], R. Gambari[5], J. Dostalek[2], W. Knoll[2], G. Spoto[1,3] [1]*Department of Chemical Sciences, University of Catania, Italy.* [2]*AIT-Austrian Institute of Technology GmbH, Tulln, Austria.* [3]*INBB, Istituto Nazionale di Biostrutture e Biosistemi, Roma, Italy.* [4]*Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Italy.* [5]*Department of Life Sciences and Biotechnology, Section of Biochemistry and Molecular Biology, University of Ferrara, Italy* **12:30-12:45 [O1B.02]** **DNA nanotechnology toolbox for next-generation biosensor design** I. Rutten, S. Safdar, K. Ven, A. Montserrat, D. Daems, D. Spasic, J. Lammertyn	**Stream 2B - Smartphone diagnostics, wearable biosensors and mobile health** **Session Chairs: Arben Merkoçi & Kar Seng Teng** **12:15-12:30 [O2B.01]** **Smartphone enabled dynamic chemiluminescence biomarker quantitation using acoustic tweezer approach** X. Duan, X. Chen *Tianjin University, China* **12:30-12:45 [O2B.02]** **Battery-free and flexible tag for wireless in situ quantification of urinary albumin/creatinine ratio to monitor early nephropathy** G. Xu, Y. Jia, X. Li, C. Cheng, J. Xu, Z. Liu, Q. Liu *Zhejiang University, China* **12:45-13:00 [O2B.03]** **Wireless battery-free flexible electrochemical devices for long-term in vivo monitoring peritonitis and peritoneal carcinomatosis** J. Xu, C. Chen, G. Xu, Y. Lu, Q. Liu *Zhejiang University, China*	**Stream 3B - Nanobiosensors, nanomaterials & nanoanalytical systems** **Session Chairs: Can Dincer & Aurlie Spinelli** **12:15-12:45 [KEYNOTE 3B]** **Nanopore blockade sensors for ultrasensitive detection of single protein molecules in complex biological samples** K. Chuah[1], Y.F. Wu[1], S.R.C. Vivekchand[1], K. Gaus[2], P.J. Reece[3], A.P. Micolich[3], J.J. Gooding[1] [1]*Australian Centre for NanoMedicine and the ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, The University of New South Wales, Australia.* [2]*EMBL Australia Node in Single Molecule Science and the ARC Centre of Excellence in Advanced Molecular Imaging, The University of New South Wales, Australia.* [3]*The University of New South Wales, Australia* **12:45-13:00 [O3B.01]** **Two-dimensional hybrid plasmonic metamaterials for biosensing applications** G.I. Tselikov[1], V.G. Kravets[2], D.I. Yakubovsky[1], D. Grudinin[1], A.N. Grigorenko[2], A.V. Kabashin[3]	**Stream 4B - Lab-on-a-chip and multiplexed sensors** **Session Chairs: Meno Prins & ChienFu Chen** **12:15-12:45 [KEYNOTE 4B]** **Microneedle-peptide biosensing technology for multiplexed monitoring of kinase cancer biomarkers in skin** M. Pellerano[1], P. Henri[1], N. Rajendran[2], D. Miura[2], L. Meunier[1], T. Cass[3], O. Guy[2], S. Sharma[2], M.C. Morris[1] [1]*Institut des Biomolécules Max Mousseron, CNRS, University Montpellier, France.* [2]*College of Engineering, Swansea University Bay Campus, Swansea, UK.* [3]*Imperial College London, UK* **12:45-13:00 [O4B.01]** **Optimization of gas sensors for breath analysis and food monitoring** A. Milone[1,2], Silvia Rizzato[1,2]Luigi Carbone[2], Riccardo Scarfiello[2], Giuseppe Maruccio[1,2], Anna Grazia Monteduro[1,2] [1]*Omnics Research Group, Department of Mathematics and Physics, University of Salento, Italy.* [2]*CNR NANOTEC - Istituto di Nanotecnologia, Italy*

	KU Leuven, Belgium **12:45-13:00 [O1B.03]** **Ultrasensitive label-free electrochemical aptasensor for selective detection of lactoferrin** M. Naseri, M. Mohammadniaei, J. Ashley, Y. Sun *Denmark Technical University, Denmark* **13:00-13:15 [O1B.04]** **Terahertz biosensor for PCR-free DNA detection in relation to tumor marker MIA** M. Richter[1], C. Weisenstein[1], D. Schaar[2], A. K. Wigger[1], A. K. Bosserhoff[2], P. Haring Bolívar[1] [1]*Institute of High Frequency and Quantum Electronics HQE, University of Siegen, Germany.* [2]*Institute of Biochemistry, Friedrich-Alexander-University Erlangen-Nürnberg, Germany* **13:15-13:30 [O1B.05]** **The prospects of using a GlyFS sensor on screen printed electrodes for the electrochemical detection of glycine** K. Murugappan, U. Sundaramoorthy, A. Damry, C. Jackson, A. Tricoli *Australian National University, Australia* **13:30-13:45 [O1B.06]** **Potential vs shortcomings of epitope MIPs for the recognition of natural and recombinant proteins** A. Yarman[1], G. Caserta[2], X. Zhang[1], P. Borrero[1], S. Frielingsdorf[2], E. Supala[3], A. T. Waffo[2], I. Zebger[2], O.r Lenz[2], F.F. Bier[1], R. E. Gyurcsányi[3], U. Wollenberger[1], F. W. Scheller[4] [1]Universität Potsdam, Germany. [2]Technische Universität Berlin, Germany. [3]Budapest University of Technology and Economics, Hungary. [4]Universität Potsdam, Institute for Biochemistry and Biology/UP Transfer GmbH, Germany	**13:00-13:15 [O2B.04]** **Non-invasive biosensing with saliva as model medium** S.K. Jha *Indian Institute of Technology Delhi, India* **13:15-13:30 [O2B.05]** **Smartphone-based potential-scanning localized surface plasmon resonance biosensor with MXene coated gold nanomushroom for glycosylated hemoglobin detection** Z. Chen, Q. Zhang, S.S. Low, J. Liu, Y. Lu, Prof. Q. Liu *Zhejiang University, China* **13:30-13:45 [O2B.06]** **Roll-to-roll printing of nanotechnology-based biosensors; Bringing nanobiosensors to mass market** K.S. Teng *Swansea University, UK*	[1]*Moscow Institute of Physics and Technology, Russia.* [2]*The University of Manchester, UK.* [3]*Aix-Marseille University, France* **13:00-13:15 [O3B.02]** **Electrical monitoring of infection biomarkers in chronic wounds using nanochannels** A. Iglesias-Mayor[1], O. Amor-Gutiérrez[1], C. Toyos-Rodríguez[1], A. Bassegoda[2], T. Tzanov[2], A. de la Escosura-Muñiz[1,3] [1]*NanoBioAnalysis Group - Department of Physical and Analytical Chemistry, University of Oviedo, Spain.* [2]*Grup de Biotecnologia Molecular i Industrial, Department of Chemical Engineering, Universitat Politècnica de Catalunya, Spain.* [3]*Biotechnology Institute of Asturias, University of Oviedo, Spain* **13:15-13:30 [O3B.03]** **Heat-transfer method: a thermal analysis technique for the detection of a variety of biomedical targets** A. Hudson[1], R. Crapnell[2], O. Jamieson[1], K. Betlem[3], Dr. K. Eersels[4], B. van Grinsven[4], T. Cleij[4], C. Banks[2], M. Peeters[1] [1]*Newcastle University, UK.* [2]*Manchester Metropolitan University, UK.* [3]*Universite Libre de Bruxelles, Belgium.* [4]*Maastricht University, The Netherlands* **13:30-13:45 [O3B.04]** **Design of a nanobiosensor via advanced laser and gold nanoparticle deposition techniques** C. Hughes[1,2], R. McCann[1,2], B. Freeland[1,2], F. Regan[1,3], N. Barron[4,5], D. Brabazon[1,6] [1]*Dublin City University, Ireland.* [2]*Advanced Processing Technologies Centre, Ireland.* [3]*DCU Water Institute, Ireland.* [4]*University College Dublin, Ireland.* [5]*National Institute for Bioprocessing Research and Training, Ireland.* [6]*I-Form Advanced Manufacturing Research Centre, Ireland*	**13:00-13:15 [O4B.02]** **Multiplexed lab-on-a-chip platform for DNA and protein analysis using graphene transistors** P. Alpuim[1,2], J.R. Guerreiro[1], T. Domingues[1], Dr. A. Purwidyantri[1], Dr. A. Ipatov[1], P.D. Cabral[1,2], M. Prado[1], J. Borme[1] [1]*International Iberian Nanotechnology Laboratory, Portugal.* [2]*University of Minho, Portugal* **13:15-13:30 [O4B.03]** **High resolution Electro-Optical imaging for live cell based (bio)sensing** M. Gheorghiu, C. Polonschii, S. Gáspár, S.M. David, E. Gheorghiu *International Centre of Biodynamics, Romania* **13:30-13:45 [O4B.04]** **Semi-quantitative detection of the inflammatory biomarkers, C-reactive protein and procalcitonin for rapid pneumonia triage** A. Iles, P. He, I. Katis, P. Galanis, A. John, J. Teeling, C. Holmes, J. Amin, R. Eason, C. Sones *University of Southampton, UK*
13:45-14:15	**Networking in the Lounge**			
14:15-15:45	**Stream 1C - Novel transducers** **Session Chairs: Hyonchol Kim & Larysa Baraban** **14:15-14:30 [O1C.01]** **Electrocatalytic acupuncture of redox-active nitric oxide with high space-time resolution** T. Gao, J. Guo, T. Wei *Nanjing Normal University, China*	**Stream 2C - Natural & synthetic receptors (including MIPs)** **Session Chairs: Koji Sode & Zeynep Altintas** **14:15-14:30 [O2C.01]** **A gold nanoparticle decorated MIP sensor for ultrasensitive nonenzymatic glucose detection in human serum**	**Stream 3C - Rapid methods for the detection of viruses** **Session Chairs: Frances Ligler & Alexander Winton** **14:15-14:30 [O3C.01]** **An AIEgen/graphene oxide composite based two-stage "turn-on" biosensor for rapid**	**Stream 4C - Nanobiosensors, nanomaterials & nanoanalytical systems** **Session Chairs: Pedro Estrela & Man Bock Gu** **14:15-14:45 [KEYNOTE 4C]** **Graphene quantum dots for biosensing and bioimaging**

14:30-14:45 [O1C.02]
Vibrating cantilevers modified with macroporous molecularly imprinted polymers (MIPs) films for selective chemosensing of proteins
M. Dabrowski, C. Ayela, A. Kuhn
Université de Bordeaux, CNRS, Bordeaux INP, ENSCBP, , France

14:45-15:00 [O1C.03]
Biosensing by direct observation of leaky waveguide modes
N.J. Goddard, R. Gupta
Process Instruments (UK) Ltd, UK

15:00-15:15 [O1C.04]
Realtime biosensing from small molecules to mammalian cells using advanced quartz crystal resonator methods
S. Ghosh[1], A. Guha[1], J. Nasterski[1], C. Da-Silva-Granja[1], V. Ostanin[2]
[1]*Loughborough University, UK.* [2]*University of Cambridge, UK*

15:15-15:30 [O1C.05]
UV-activated Semiconductor-based Biosensor for Lactate Monitoring in Sweat
N. Taleghani, F. Taghipour
University of British Columbia, Canada

15:30-15:45 [O1C.06]
Regenerable miniaturized microbalance arrays for longitudinal, multiplexed monitoring of biosystems
M. Daniele[1,2], S. Menegatti[1], T. Fabiani[1], H. Reese[1], V. Pozdin[1]
[1]*North Carolina State University, USA.* [2]*University of North Carolina at Chapel Hill, USA*

E. Sehit, J. Drzazgowska, D. Buchenau, Dr. Z. Altintas
Technical University of Berlin, Germany

14:30-14:45 [O2C.02]
The "Abta-sensor" ~development of antibody–aptamer one-to-one complex to realize a novel biosensing principle~
E. Wilson[1], J. Lee[1], S. Henley[1], R. Asano[2], K. Ikebukuro[2], K. Sode[1]
[1]*University of North Carolina at Chapel Hill, USA.* [2]*Tokyo University of Agriculture and Technology, Japan*

14:45-15:00 [O2C.03]
Bioinspired herbicide binding proteins from Chlamydomonas reinhardtii as novel synthetic biomimetics for sensing applications
A. Antonacci[1], P. Calandra[2], G. Barone[3], F. Lo Celso[4], V. Scognamiglio[1]
[1]*Institute of Crystallography, National Research Council, Italy.* [2]*Institute of Nanostructured Materials, National Research Council, Italy.* [3]*Università degli Studi di Palermo, Dipartimento STEBICEF, Italy.* [4]*Università degli Studi di Palermo, Dipartimento di Fisica e Chimica, Italy*

15:00-15:15 [O2C.04]
Label-free colorimetric detection of calprotectin using photonic crystals-based sensor and molecular imprinting technology
S. Resende[1,2,3], M. F. Frasco[1,2,3], P. P. Freitas[4,5], M.G.F. Sales[1,2,3]
[1]*BioMark@UC, Faculty of Sciences and Technology, University of Coimbra, Coimbra, Portugal.* [2]*BioMark@ISEP, School of Engineering, Polytechnic Institute of Porto, Porto, Portugal.* [3]*CEB, Centre of Biological Engineering, University of Minho, Braga, Portugal.* [4]*Instituto de Engenharia de Sistemas e Computadores - Microsistemas e Nanotecnologias, Lisboa, Portugal.* [5]*INL - International Iberian Nanotechnology Laboratory, Braga, Portugal*

15:15-15:30 [O2C.05]
Integrated approaches toward high-affinity synthetic protein binders obtained via computationally simulated epitopes for biosensing
Z. Altintas[1], R. Tchinda[1], A. Tutsch[1], J. Drzazgowska[1], M. Mroginski[1], F. Scheller[2], B. Schmid[1], R. Sussmuth[1]
[1]*Technical University of Berlin, Germany.* [2]*University of Potsdam, Germany*

detection of SARS-CoV-2 nucleic acid sequence
Q. Zhang[1], B. Yin[1], Y. Huang[1], J. Hao[2], S.H.D. Wong[1], M. Yang[1]
[1]*Department of Biomedical Engineering, the Hong Kong Polytechnic University, Hong Kong.* [2]*Department of Applied Physics, the Hong Kong Polytechnic University, Hong Kong*

14:30-14:45 [O3C.02]
Inkjet-printed Smartphone-based Aptasensor for the Label-Free Detection of SARS-CoV-2
J. Marrugo-Ramírez[1], G. Rosati[1], C. de Carvalho Castro e Silva[2,1], A. Bonini[3,1], M. Urban[1], A. Merkoçi[1,4]
[1]*Catalan Institute of Nanoscience and Nanotechnology (ICN2), Spain.* [2]*Graphene and Nanomaterials Research Center – MackGraphe, Brazil.* [3]*Department of Chemistry and Industrial Chemistry – University of Pisa, Italy.* [4]*ICREA, Institució Catalana de Recerca i Estudis Avançats, Spain*

14:45-15:00 [O3C.03]
Lateral flow device for the dual detection of SARS-CoV-2 Coronavirus Nucleocapsid and Spike protein: A large-scale, rapid, point-of-care testing solution for Covid-19
A. Iles, P. He, M. Humbert, A. John, I. Katis, T. Clark, M. Christodoulides, R. Eason, C. McCormick, C. Sones
University of Southampton, UK

15:00-15:15 [O3C.04]
Reagent-free Electrochemical Sensor for Intact SARS-CoV-2 Viral Detection
A. Mahmud, H. Yousefi, D. Chang, J. Das, S. Gomis, J. Chen, H. Wang, E. Sargent, S. Kelley
University of Toronto, Canada

15:15-15:30 [O3C.05]
Hand-held devices for Detection of SARS-CoV-2 Viral Particles using Direct, Reagent-Free Electrochemical Sensing
H. Yousefi, A. Mahmud, D. Chang, J. Das, S. Gomis, J. Chen, H. Wang, C. Flynn, T. Been, L. Yip, E. Coomes, Z. Li, S. Mubareka, A. McGeer, N. Christie, S. Gray-Owen, A. Cochrane, J. Rini, E. Sargent, S. Kelley
University of Toronto, Canada

15:30-15:45 [O3C.06]
Development of Protein Catalyzed Capture Agents for Applications in SARS-CoV-2 Sensing
A. Winton[1], M. Idso[2], M. Coppock[1], J. Hopkins[2], Sanchao Liu[1], Bert Lai[3], A. Eliasen[3], Sunga P. Chen
Nanyang Technological University, Singapore

14:45-15:00 [O4C.01]
Biosensing applications of Au/Cu foam based microfabricated gold electrode arrays
V.B. Juska, M.E. Pemble
Tyndall National Institute, University College Cork,, Ireland

15:00-15:15 [O4C.02]
Quantification of stable RNAs combining the Cas13a toolkit and nanozyme-amplified readout
M. Broto[1], M. Kaminski[2], C. Adrianus[1], H. Kim[1], Dr. E. Gray[3]J.J. Collins[2,4], M.M. Stevens[1]
[1]*Imperial College London, UK.* [2]*Massachusetts Institute of Technology, USA.* [3]*University College London, UK.* [4]*Broad Institute of MIT and Wyss Institute for Biologically Inspired Engineering Harvard, USA*

15:15-15:30 [O4C.03]
Development of high-performance electrochemical biosensors for clinical analysis
F. Beck[1], C. Horn[2], A.J. Baeumner[1]
[1]*University of Regensburg, Germany.* [2]*Roche Diagnostics, Germany*

15:30-15:45 [O4C.04]
Infrared Metasurfaces Augmented by Artificial Intelligence for Monitoring Dynamics between All Major Classes of Biomolecules
A. John-Herpin, D. Kavungal, L. von Mücke, H. Altug
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

			Hong[2], J. Yee[2], R. Calder[2],K. Museth[3], H. Agnew[3], M. Klimas[3], J. Heath[2] *[1]US Army Research Laboratory, USA. [2]Institute for Systems Biology, USA. [3]Indi Molecular, Inc., USA*	
15:45-16:45	**Poster Session 1**		**WORKSHOP - QSense QCM-D analysis in virus research – instrument portfolio and three user case examples**	
16:45-17:00				

28th July 2021

08:30-09:30	**Poster Session 2**		**WORKSHOP - Achieving ultra-high sensitivity COVID-19 detection with a MIP enabled sensor**	
09:30-11:00	**Plenary Session 2 & Announcement of Biosensors and Bioelectronics Prize** Chair of Prize Committee Anthony P.F. Turner; Prize presented by Nigel Clear (Elsevier) **Session Chairs: Justin Gooding & Xian-En Zhang** **09:40-10:20 [PLN03]** **Designing nanomaterials for ultrasensitive biosensing** Molly Stevens *Imperial College London, UK* **10:20-11:00 [PLN04]** **Nanophotonics and metasurfaces for optical biosensing** Hatice Altug *Ecole Polytechnique Federal de Lausanne, Switzerland*			
11:00-11:15	**Networking in the Lounge**			
11:15-12:45	**Stream 1D - DNA- and nucleic acid-based sensors and aptasensors** **Session Chairs: Joong Hyun Kim & Weihong Tan** **11:15-11:30 [O1D.01]** **DNA aptasensors for neurochemical sensing in complex media** N. Nakatsuka[1], A. Faillétaz[1], K. Vadodaria[2], D. Eggemann[1], F. H. Gage[2], D. Momotenko[1], J. Vörös[1] *[1]Institute for Biomedical Engineering, Switzerland. [2]The Salk Institute for Biological Studies, USA* **11:30-11:45 [O1D.02]** **Incorporating peptide aptamers into resistive pulse sensing** R. Maugi[1], Z. Salkenova[2], M. Platt[1]	**Stream 2D - Bioelectronics (including biocomputing, bio-fuel and photovoltaic cells, and electronic noses)** **Session Chairs: Sotiria Psoma & Ana Ceclia Roque** **11:15-11:45 [KEYNOTE 2D]** **Self-assembling proteins for bio-inspired nano-electronics** J. Champavert[1,2], J. Hurtaud[1], C. Mathevon[1], A. Jorge-Robin[1], P. Rannou[2], V. Forge[1] *[1]CEA Grenoble - LCBM - AFFOND - UMR 5249, France. [2]CNRS/CEA Grenoble/Univ. Grenoble Alpes - SyMMES - UMR 5819, France* **11:45-12:00 [O2D.01]**	**Stream 3D - Nanobiosensors, nanomaterials & nanoanalytical systems** **Session Chairs: Cian Hughes & Zdeněk Farka** **11:15-11:30 [O3D.01]** **A SERS based nano-mesoporous gold platform to analyse immune checkpoint proteomic heterogeneity in single cancer cells.** E Ahmed, P Komatineni, MK Masud, MSA Hossain, AAI Sina, Y Yamauchi, M Trau *The University of Queensland, Australia* **11:30-11:45 [O3D.02]** **Quantitative detection of multiplex exosomal miRNAs for clinically accurate diagnosis of alzheimer's disease using label-free**	**Stream 4D - Lab-on-a-chip and multiplexed sensors** **Session Chairs: Sanjiv Sharma &Pedro Alpuim** **11:15-11:30 [O4D.01]** **A rapid all-on-paper-based biosensor toolkit for pathogens** A. Fifame Oussou-Azo, M. C. Vestergaard *Kagoshima University, Japan* **11:30-11:45 [O4D.02]** **Interconnectable solid-liquid protein extraction unit and chip-based dilution for multiplexed consumer allergen immunodiagnostics** G. M.S. Ross[1], Daniel Filippini[2], Michel. W.F. Nielen[1], Gert. IJ Salentijn[1] *[1]Wageningen University & Research, The Netherlands. [2]Linköping University, Sweden*

[1]*Loughborough University, UK.* [2]*Nazarbayev University, School of Sciences and Humanities, Chemistry Department, Kazakhstan*

11:45-12:00 [O1D.03]
Fishing and pre-concentration of microRNAs by LNA-modified magnetic beads for enhancement of electrochemical detection
S. Ustuner, M. Lindsay, P. Estrela
University of Bath, UK

12:00-12:15 [O1D.04]
Portable electrode-embedded lateral flow biosensors using a pair of sandwich-type binding aptamers
J.T. Kim, C.M. Joe, S.H. Kim, M.B. Gu
Korea University, Republic of Korea

12:15-12:30 [O1D.05]
Multivalent DNA biosensor for infectious disease diagnostics with single-molecule control
D. Huang, R.A. McKendry
London Centre for Nanotechnology, UCL, UK

Fluorometric real-time bioelectrocatalytic analysis platform for P450 BM3 on 96-well indium tin oxide electrode arrays
R. Frank, H-G. Jahnke, A.A. Robitzki
Leipzig University, Germany

12:00-12:15 [O2D.02]
A bioelectronic nose combined with genetic engineering for odor detection
P. Zhu[1], L.P. Du[1], Y.L. Tian[1], Y.T. Chen[1], W. Chen[1], C.S. Wu[1], P. Wang[2]
[1]*Xi'an Jiaotong University, China.* [2]*Zhejiang University, China*

12:15-12:30 [O2D.03]
Self-powered L-lactate sensor based on BioCapacitor principle employing extremophile derived engineered cathodic enzyme
T. Satomura[1], I. Lee[2,3], K. Batchu[3,4], T. Le[4], K. Hiraka[2], W. Tsugawa[2], S. Suye[1], K. Sode[3,4]
[1]*Division of Engineering, Faculty of Engineering, University of Fukui, Japan.* [2]*Graduate School of Engineering, Tokyo University of Agriculture and Technology, Japan.* [3]*University of North Carolina at Chapel Hill, USA.* [4]*North Carolina State University, USA*

12:30-12:45 [O2D.04]
Intelligent gels for artificial olfaction
A. Roque, C. Esteves, S. Palma, I. Moreira, A. Oliveira, G. Teixeira, I. Padrão, J. Santos, Guilherme Rebordão
NOVA University of Lisbon, Portugal

plasmonic biosensor based on DNA-assembled advanced plasmonic architectures
S. Song, J. U. Lee, S. J. Sim
Korea University, Republic of Korea

11:45-12:00 [O3D.03]
Label-free and highly sensitive nanoplasmonic biosensor-based autophagy flux sensing for clinical application
Y. J. Choi, J. U. LEE, S. J. Sim
Korea University, Republic of Korea

12:00-12:15 [O3D.04]
Single particle cryo-electron microscopy observation based strategic design of direct electron transfer type enzyme and its sensor applications
K. Ito[1], J. Okuda-Shimazaki[2,3], W. Tsugawa[1], K. Ikebukuro[1], R. Asano[1], T. Hashimoto[4], Y. Tanaka[4], B. Humbel[5], R. Kanno[5], K. Sode[2,3]
[1]*Tokyo University of Agriculture and Technology, Japan.* [2]*University of North Carolina at Chapel Hill, USA.* [3]*North Carolina State University, USA.* [4]*Tohoku University, Japan.* [5]*Okinawa Institute of Science and Technology Graduate University, Japan*

11:45-12:00 [O4D.03]
AstroBio-CubeSat: A Lab-in-Space for chemiluminescence-based astrobiology experiments
D. Calabria[1], I. Trozzi[1], J.R. Brucato[2], A. Nascetti[3], L. Iannascoli[3], A. Meneghin[2], D. Paglialunga[3], C. Pacelli[4], G. Impresario[4], S. Carletta[3], L. Anfossi[5], L. Popova[6], A. Donati[6], M. Balsamo[6], D. Caputo[3], G. de Cesare[3], E. Marchegiani[1], M. Zangheri[1], M. Guardigli[1], M. Mirasoli[1]
[1]*University of Bologna, Italy.* [2]*INAF-Astrophysical Observatory of Arcetri, Italy.* [3]*Sapienza University, Italy.* [4]*ASI - Italian Space Agency (ASI), Italy.* [5]*University of Torino, Italy.* [6]*Kayser Italia S.r.l., Livorno, Italy*

12:00-12:15 [O4D.04]
Nanowire sensor devices for real time blood cells analysis
L. Baraban[1,2], J. Schuett[1,2], D. Sandoval-Bojorquez[1], S. Mata-Oliveros[1], M. Bachmann[3], G. Cuniberti[2]
[1]*Helmholtz Center Dresden Rossendorf, Germany.* [2]*Max Bergmann Center of Biomaterials, Germany.* [3]*Institute of RadiopharmaceuticaA, Germany*

12:15-12:30 [O4D.05]
Specially-designed photonic crystal fibre, an efficient SERS-platform for next generation of liquid-biopsy needle
G. Humbert[1], D. U.S[2], F. Beffara[1,2], J. Perumal[2], A. Puteri Mahyuddin[3], M. Choolani[3], J-L. Auguste[1], S. Vedraine[1], M. Olivo[2]
[1]*University of Limoges, France.* [2]*Singapore Bioimaging Consortium, A*STAR, Singapore.* [3]*Yong Loo Lin School of Medicine, Singapore*

12:30-12:45 [O4D.06]
Automated system for rapid molecular detection of antibiotic resistant pathogens at the level of single colony forming units
N. Borst[1,2], M. Schulz[1], S. Calabrese[1], M. Specht[1], A. Gerhards[3], M. Handel[3], F. Hausladen[4], K. Stock[4], N. Paust[1,2], F. von Stetten[1,2]
[1]*Hahn-Schickard, Germany.* [2]*University of Freiburg, Germany.* [3]*Hohenstein Institute GmbH, Germany.* [4]*Institute for Laser Technology in Medicine and Measurement Technique, Germany*

12:45-13:15 **Networking in the Lounge**

13:15-14:30

Stream 1E - DNA- and nucleic acid-based sensors and aptasensors

Session Chairs: Mihaela Gheorghiu & Yi-Kuang Yen

13:15-13:30 [O1E.01]
Gold Nanoparticle-Assisted SELEX: A Visualizing and Self-Monitoring Platform for Facile Selection of Target-Binding Aptamers
E.S. Lee, Y.P. Kim
Hanyang University, Republic of Korea

13:30-13:45 [O1E.02]
Detection of Interferon gamma using graphene/conductive polymer modified paper-based electrochemical aptasensor
Y.S. Yeh[1], Y.K. Yen[2]
[1]*Institute of Manufacturing Technology, National Taipei University of Technology, Taiwan.* [2]*Department of Mechanical Engineering, National Taipei University of Technology, Taiwan*

13:45-14:00 [O1E.03]
Nicking-assisted molecular amplification for real-time optomagnetic DNA detection
B. Tian[1], J. Fock[2], G.A.S. Minero[1], M.F. Hansen[1]
[1]*Technical University of Denmark, Denmark.* [2]*Blusense Diagnostics ApS, Denmark*

14:00-14:15 [O1E.04]
Microfluidic channel integrated and gold nanoflowers-structured electrochemical aptasensor device for the real-time detection of di(2-ethylhexyl) phthalate
K.Y. Lee, N.G. Gurudatt, W. Heo, K.A. Hyun, H.I. Jung
Yonsei university, Republic of Korea

Stream 2E - Immunosensors

Session Chairs: Ryutaro Asano & Sang Jun Sim

13:15-13:30 [O2E.01]
Developing of Rotational Diffusometry for Detecting Tumor Necrosis Factor Alpha by Using Janus Particles
W.L. Chen[1], H.S. Chuang[2]
[1]*Department of Biomedical Engineering, National Cheng Kung University, Taiwan.* [2]*Medical Device Innovation Center, National Cheng Kung University, Taiwan*

13:30-13:45 [O2E.02]
Enhanced EDL-gated FET biosensors for direct protein detection in physiological sample
C.R. Wu, P.H. Chen, Y.L. Wang, C-C. Wu
National Tsing Hua University, Taiwan

13:45-14:00 [O2E.03]
PM Q-probe: a fluorescent binding protein that converts many natural antibodies to a fluorescent biosensor
H. Ueda[1], J. Dong[1,2], T. Yasuda[1], M. Takahashi[1], K. Sasamoto[1], H. Oyama[3], I. Morita[3], H.J. Jeong[4], T. Kitaguchi[1], N. Kobayashi[3]
[1]*Tokyo Institute of Technology, Japan.* [2]*Weifang Medical University, China.* [3]*Kobe Pharmaceutical University, Japan.* [4]*Hongik University, Republic of Korea*

14:00-14:15 [O2E.04]
Repeated measurement of cardiac marker by surface plasmon-enhanced fluorescence immunosensor for prevention of perioperative myocardial infarction
K. Toma, K. Oishi, T. Arakawa, K. Mitsubayashi
Tokyo Medical and Dental University, Japan

14:15-14:30 [O2E.05]
Direct detection of extracellular vesicles in plasma and serum samples using a fiber optic SPR dip probe
Y. Yildizhan[1], V. Vajrala[1], E. Geeurickx[2], F. Delport[3], D. De Sutter[2], S. Eyckerman[2], J. Swinnen[1], A. Hendrix[2], J. Lammertyn[1], D. Spasic[1]
[1]*KU Leuven, Belgium.* [2]*Ghent University, Belgium.* [3]*FOx Biosystems, Belgium*

Stream 3E - Single molecule detection and antibiotic sensitivity testing

Session Chairs: Jian-An Huang & Volker Gatterdam

13:15-13:30 [O3E.01]
Detection of photoactive proteins using elongated metallic nanoparticles
K. Sulowska[1], J. Grzelak[1], Mr. M. Domagalska[1], Dr. E. Rozniecka[2], Prof. J. Niedziolka-Jonsson[2], Prof. S. Mackowski[1]
[1]*Nicolaus Copernicus University, Poland.* [2]*Polish Academy of Sciences, Poland*

13:30-13:45 [O3E.02]
Digital detection of subfemtomolar concentrations of prostate-specific antigen by single molecule immunosensing
H.H. Gorris[1], M.J. Mickert[1], Z. Farka[2], U. Kostiv[3], A. Hlavacek[4], D. Horak[3], P. Skladal[2]
[1]*University of Regensburg, Germany.* [2]*CEITEC MU, Masaryk University, Czech Republic.* [3]*Institute of Macromolecular Chemistry of the Czech Academy of Sciences, Czech Republic.* [4]*Institute of Analytical Chemistry of the Czech Academy of Sciences, Czech Republic*

13:45-14:00 [O4E.03]
Probing DNA hybridization kinetics in living cells using a 3D single-molecule tracking method
Y-I. Chen, T. Yeh, S. Hong
University of Texas at Austin, USA

14:00-14:15 [O3E.04]
Bacterial navigation through uniform and non-uniform mazes
M. Nayak[1], A. Sudalaiyadum Perumal[1], V. Tokarova[1,2], O. Kaspar[1,2], Prof. D. Nicolau[1]
[1]*McGill University, Canada.* [2]*University of Chemical Technology, Prague, Czech Republic*

14:15-14:30 [O3E.05]
Real-time monitoring of bacterial growth and antibiotic susceptibility in blood using vertical capacitance aptasensors
J.H. Song[1], S.M. Lee[1], I.H. Park[2], D. Lee[2], K.S. Lee[1], J.S. Shin[2], K.H. Yoo[1]
[1]*Yonsei University, Republic of Korea.* [2]*Yonsei University College of Medicine, Republic of Korea*

Stream 4E - Lab-on-a-chip and multiplexed sensors

Session Chairs: Peng Chen & Jeong-Woo Choi

13:15-13:30 [O4E.01]
Multiplexed surface protein profiling of tumor-derived extracellular vesicles by an electrokinetic sensor
S. Cavallaro[1], V. Arapi[2], L. Berisha[1], P. Hååg[2], C. Stiller[1], K. Viktorsson[2], R. Lewensohn[2], A.E. Karlström[1], J. Linnros[1], A. Dev[3]
[1]*KTH Royal Institute of Technology, Sweden.* [2]*Karolinska Institutet, Sweden.* [3]*Uppsala University, The Ångström laboratory, Sweden*

13:30-13:45 [O4E.02]
Electrocatalytic nitric oxide sensor for organ-on-chips
E. Tanumihardja[1], A. Paradelo Rodríguez[2], B. Mei[2], W. Olthuis[1], A. van den Berg[1]
[1]*BIOS Lab-on-a-Chip group, University of Twente, The Netherlands.* [2]*Photocatalytic Synthesis group, University of Twente, The Netherlands*

13:45-14:00 [O4E.03]
Dielectric Fano metasurface for high-resolution imaging and biosensing
D. Conteduca[1], I. Barth[1], G. Pitruzzello[1], C.P. Reardon[1], E.R. Martins[2], T.F. Krauss[1]
[1]*Photonics Group, University of York, UK.* [2]*São Carlos School of Engineering, University of São Paulo, , Brazil*

14:00-14:15 [O4E.04]
A point-of-care microfluidic system for traumatic brain injury diagnosis and prognosis
A.D. Krausz, S.E. Mena, M.P. de Beer, F. Korley, M.A. Burns
University of Michigan, USA

14:15-14:30 [O4E.05]
Surface Plasmon Resonance Imaging in combination with Ganglioside Microarray and Deep Learning for Detection of Multiple Sclerosis Biomarkers in Patient Serum
A. Malinick, A. Lambert, D.I Stuart, Q. Cheng[1]
[1]*Univeristy of California, Riverside, USA.*

14:30-15:00 **Networking in the Lounge**

15:00-17:00

Stream 1F - Microfluidics and immobilisation technology

Session Chairs: Michael Daniele & Evgeni Eltzov

15:00-15:15 [O1F.01]
Microfluidic model for lymphatic transport
G. Lee[1,2], W. Polacheck[1,2], F. Ligler[1,2]
[1]University of North Carolina at Chapel Hill, USA. [2]North Carolina State University, USA

15:15-15:30 [O1F.02]
Paper-origami device enabling low-cost and rapid microbial analysis
K. Mao, F. TuerkZ. Yang
Cranfield Univeristy, UK

15:30-15:45 [O1F.03]
Stimuli-responsive plasma-polymerized hydrogels for biosensing and biomedical applications
M. Levien,. Amin, K.D. Weltmann, K. Fricke
Leibniz Institute for Plasma Science and Technology (INP), Germany

15:45-16:00 [O1F.04]
Microfluidic and electrical study of the antibiotic susceptibility of single bacteria
G. Pitruzzello, D. Conteduca, S. Johnson, T. Fraser Krauss
University of York, UK

16:00-16:15 [O1F.05]
Innovative nanoparticle functionalization strategy designed for microfluidic single-cell cytokine secretion dynamic profiling of immune cells
M. Mistretta, Y. Bounab, B. Beitz, S. DixneufC. Vedrine
BIOASTER, France

16:15-16:30 [O1F.06]
Paper-based microfluidic devices for rapid detection of microbial contamination in water
Y. Pan[1], K. Mao[1], J. Reboud[1], J. Cooper[1], Z. Yang[2]
[1]University of Glasgow, UK. [2]Cranfield University, UK

16:30-16:45 [O1F.07]
Phage endolysin biointerface for electrochemical paper-based bacteria sensors

Stream 2F - Enzyme-based biosensors

Session Chairs: Hyun Chul Yoon & John D. Brennan

15:00-15:30 [KEYNOTE 2F]
Combining light with enzyme electrochemistry for multiplexing and improved potential behaviour
M. Riedel[1], W. Parak[2], F. Lisdat[1]
[1]Biosystems Technology, Institute for Applied Life Sciences, Technical University Wildau, Germany. [2]Institute of Nanostructures and Solid-State Physics, University Hamburg, Germany

15:30-15:45 [O2F.01]
MXene-enabled minimally invasive polymer microneedle biosensor for continuous glucose monitoring
H. Kim[1], H. Yoon[1], M. Sharifuzzaman[1], S. Seonu[1], J. Park[2], J. Park[1]
[1]Kwangwoon University, Republic of Korea. [2]National NanoFab Center, Republic of Korea

15:45-16:00 [O2F.02]
Non-invasive early detection of calpain 2-enriched non-small cell lung cancer using a human serum albumin-based calpain-2 nanosensor
S-H. Kwon[1], X. Xu[2], Y.I. Park[3], J.H. Kim[4], J.H. Choi[5], R. Lee[6]
[1]Korea Basic Science Institute, Seoul, Republic of Korea. [2]University of Technology Sydney, Australia. [3]Chonnam National University, Republic of Korea. [4]Yonsei Wonju Hospital, Republic of Korea. [5]Kangwon National University, Republic of Korea. [6]Kumamoto University, Japan

16:00-16:15 [O2F.03]
2D bio-fluorometric gas-imaging system (sniff-cam) for transdermal ethanol vapor based on enzymatic recognition
K. Iitani, K. Toma, T. Arakawa, K. Mitsubayashi
Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University (TMDU), Japan

16:15-16:30 [O2F.04]
Wireless, battery-less RFID tag design pluggable to direct electron transfer reaction of glucose dehydrogenase from Ewingella Americana

Stream 3F - Immunosensors

Session Chairs: Kazunori Ikebukuro & Ozcan Aydogan

15:00-15:15 [O3F.01]
Co-NTA chemistry for improved surface regeneration and oriented His6-tagged bioreceptor coupling on a fiber optic SPR biosensor
J.H. Qu[1], F. Delport[2], M. Sillen[1], N. Geukens[1], P. Declerck[1], J. Lammertyn[1], D. Spasic[1]
[1]KU Leuven, Belgium. [2]FOx Biosystems, Belgium

15:15-15:30 [O3F.02]
Surface functionalization strategies for the development of a nanobody-based pesticide biosensor
A. Debela[1], M. Pucci[1,2], I. Bazin[1]
[1]LGEI, IMT Mines ales, University of Montpellier, Ales, France. [2]C2MA, IMT Mines Ales, Univ Montpellier, Ales, France

15:30-15:45 [O3F.03]
Disposable immunoelectrochemical cell based on the integration of mass-produced pins into microcentrifuge tubes for differential diagnosis of stroke
A. González-López[1], C. García-Cabo Fernández[2], L. Benavente Fernández[2], S. Calleja Puerta[2], L. Lobo[1], B. Fernández[1], E. Costa-Rama[1], R. Pereiro[1], M.T. Fernández-Abedul[1]
[1]Department of Physical and Analytical Chemistry, University of Oviedo, Spain. [2]Department of Neurology, Hospital Universitario Central de Asturias (HUCA), Spain

15:45-16:00 [O3F.04]
Electrochemical Immitance Spectroscopy and Multivariate Data analysis for Detection of Therapeutic Drugs
S. Phal, P. Geladi, B. Sethson, S. Tesfalidet
Umeå University, Sweden

16:00-16:15 [O3F.05]
An open-microcavity photonic-crystal biosensor for sensitive label-free bioassays
J.Y. Ye[1], K. Baryeh[1], C. Christenson[1], M. Cadena[1], F. DeLuna[1], M. Attia[1], S. Ahadian[2], R. Nasiri[2], M. R. Dokmeci[2], M. Goudie[2]
[1]The University of Texas at San Antonio, USA. [2]University of California, USA

16:15-16:30 [O3F.06]

Stream 4F - Nanobiosensors, nanomaterials & nanoanalytical systems

Session Chairs: Nayoung Kim & Stefano Mariani

15:00-15:15 [O4F.01]
Layer-by-layer nano-assembly for label-free biosensing with nanostructured porous silicon interferometers
S. Mariani[1], V. Robbiano[1], L. Strambini[2], A. Debrassi[3], G. Egri[3], L. Dähne[3], G. Barillaro[1,2]
[1]Dipartimento di Ingegneria dell'Informazione, Università di Pisa, Italy. [2]Istituto di Elettronica e di Ingegneria dell'Informazione e delle Telecomunicazioni, Consiglio Nazionale delle Ricerche, Pisa, Italy. [3]Surflay Nanotec GmbH, Berlin, Germany

15:15-15:30 [O4F.02]
Common-path interferometric photonic biosensor with wide dynamic range and ultra-low limit of detection for small proteins
I. Barth, D. Conteduca, T.F. Krauss
University of York, UK

15:30-15:45 [O4F.03]
Low-cost and portable photonic immuno-sensor based on guided mode resonance
A. Drayton, C. Reardon, T. F.Krauss
University of York, UK

15:45-16:00 [O4F.04]
Surface-enhanced Raman scattering artificial-nose: functionalised plasmonic surfaces for high dimensionality analyses
N. Kim[1], M.R. Thomas[1], M.S. Bergholt[1], I.J. Pence[1], H. Seong[1], P. Charchar[2], N. Todorova[2], A. Nagelkerke[1], I. Yarovsky[1], M.M. Stevens[1]
[1]Imperial College London, UK. [2]RMIT University, Australia

16:00-16:15 [O4F.05]
Photon-upconversion nanoparticles as a background-free label in immunosensing and bioimaging
. Z. Farka[1], M.J. Mickert[2], A. Hlavacek[3], H.H. Gorris[2], P. Skladal[1]
[1]Masaryk University, Czech Republic. [2]University of Regensburg, Germany. [3]Czech Academy of Sciences, Czech Republic

G. Le Brun[1], A. Leprince[2], O. Crahay[1], M.-C. Eloy[3], K. Glinel[4], J. Mahillon[2], J.-P. Raskin[1]
[1]Institute of Information and Communication Technologies, Electronics and Applied Mathematics, Université catholique de Louvain (UCLouvain), Belgium. [2]Laboratory of Food and Environmental Microbiology, Earth and Life Institute, Université catholique de Louvain (UCLouvain), Belgium. [3]Louvain Institute of Biomolecular Science and Technology, Université catholique de Louvain (UCLouvain), Belgium. [4]Institute of Condensed Matter and Nanosciences (Bio and Soft Matter), Université catholique de Louvain (UCLouvain), Belgium

A. Shafaat[1,2], R. Zalneravicius[3], D. Ratautas[4,5], M. Dagys[4], R. Meškys[4], R. Rutkiene[4], J.F. Gonzalez[1,2], J. Sotres[1,2], T. Ruzgas[1,2]
[1]Faculty of Health and Society, Malmö University, Malmö, Sweden. [2]Biofilms - Research Center for Biointerfaces, Malmö University, Malmö, Sweden. [3]State Research Institute, Centre for Physical Sciences and Technology,Vilnius, Lithuania. [4]Vilnius University, Vilnius, Lithuania. [5]Vilnius Gediminas Technical University, Vilnius, Lithuania

16:30-16:45 [O2F.05]
A flower-like paper-based origami biosensor for pesticide detection in gas phase
F. Arduini[1,2], V. Caratelli[1], G. Fegatelli[1]G. Ciampaglia[1], G. Palleschi[1], D. Moscone[1]
[1]Tor Vergata University, Italy. [2]SENSE4MED, Italy

16:45-17:00 [O2F.06]
PQQ-Glucose Dehydrogenase-Calmodulin Chimera Enzyme: Different Triggered Activation for Multipurpose Biosensors
P. Bollella[1,2], A. Melman[2], Z. Guo[3]S. Edwardraja[4], W. Johnston[3], K. A. Alexandrov[3], E.y Katz[2]
[1]Dipartimento di Chimica, Università degli Studi di Bari "Aldo Moro"Italy. [2]Department of Chemistry and Biomolecular Science, Clarkson University, PotsdamUSA. [3]CSIRO-QUT Synthetic Biology Alliance, Queensland University of Technology Australia. [4]Australian Institute for Bioengineering and Nanotechnology, The University of Queensland, Australia

Traumatic brain injury (TBI) biomarker immuno-sensor for the one-step rapid detection of ubiquitin C-terminal hydrolase L1 (UCH-L1)
J. Lee[1], H. Hirano[2], W. Tsugawa[2], K. Sode[1]
[1]University of North Carolina at Chapel Hill, USA. [2]Tokyo University of Agriculture and Technology, Japan

16:30-16:45 [O3F.07]
Detection of Biofuel Contaminants Using Electrochemical Sensing
M. Brothers[1,2], J. Harris[2], M. St. Lawrence[3,4], D. Riddle[2] J. Hollomon[1,5], C. Mauzy[2], O. Ruiz[3], S. Kim[2]
[1]UES Inc, USA. [2]711th Human Performance Wing, AFRL, USA. [3]Aerospace Systems, AFRL, USA. [4]UDRI, USA. [5]Materials and Manufacturing Directorate, AFRL, USA

16:15-16:30 [O4F.06]
Zwitterion-embedded molecular imprinted mesoporous organosilica: extraordinary sensitivity and selectivity to small molecules
Y. Kim, J. Lee
KIST Europe, Germany

16:30-16:45 [O4F.07]
Controlling Bio-interfaces at Ultra-High Spatial Resolutions for High-Performance Biosensing
R. Rastogi, M. Beggiato, S. Krishnamoorthy
Luxembourg Institute of Science and Technology (LIST), Luxembourg

16:45-17:00 [O4F.08]
Spin-enhanced fluorescent nanodiamond biosensing for ultrasensitive lateral flow diagnostics
B.S. Miller, R.A. McKendry
University College London, UK

17:00-18:00 **Poster Session 3**

29th July 2021

08:00-09:00 **Poster Session 4**

09:00-10:30

Stream 1G - CRISPR-based Biosensors
Session Chairs: Abu Ali Ibn Sina & Moon Il Kim

09:00-09:30 [KEYNOTE 1G]
CRISPR-powered electrochemical biosensor for multiplexed amplification-free miRNA diagnostics
R. Bruch[1,2], J. Baaske[3], S. Madlener[4], W. Weber[3], G.A. Urban[1,5], C. Dincer[1,2]
[1]University of Freiburg, Germany. [2]Freiburg Center for Interactive Materials and

Stream 2G - Organism-, whole cell- and organ-based biosensors
Session Chairs: Justin Gooding & Andrew Kralicek

09:00-09:15 [O2G.01]
CRISPR/Cas12a-powered ultrasensitive immunosensing for the detection of single microorganisms
F. Deng, Y. Li, E. Goldys
University of New South Wales, Australia

Stream 3G - Theranostics, implantable and ingestible sensors
Session Chairs: Lingyin Meng & Hisakage Funabashi

09:00-09:30 [KEYNOTE 3G]
Advanced nanobiosensing technology for stem cell research
K.B. Lee
Rutgers University, USA

09:30-09:45 [O3G.01]

Stream 4G - Smartphone diagnostics, wearable biosensors and mobile health
Session Chairs: Guozhen Liu & Joost Nelis

09:00-09:15 [O4G.01]
Wearable potentiostat for smartphone-based sweat analysis
G. Rosati[1], M.A. Aroca[1,2], Q. Yang[1], V. Abarintos[1], J. Osma[2], A. Merkoçi[1]

Bioinspired Technologies – FIT, Germany. [3]*Signalling Research Centres BIOSS and CIBSS, Germany.* [4]*Medical University of Vienna, Austria.* [5]*Freiburg Materials Research Center – FMF, Germany*

09:30-09:45 [O1G.01]
CRISPR/cas12a and aptamer associated universal biosensing platform for ultra-sensitive analytes detection
Y. Li[1,2], F. Deng[1,2], L. Qiao[1,2], G. Liu[1,2]
[1]*University of New South Wales, Australia.* [2]*Australian Centre for NanoMedicine, Australia*

09:45-10:00 [O1G.02]
A novel impedimetric CRISPR-dCas9 biosensor for detection of PIK3CA mutations in breast cancer patients by monitoring circulating tumor DNA as liquid biopsy marker in blood
. Onur Uygun[1], L. Yeniay[2], F. Girgin Sagin[3]
[1]*Kafkas University Faculty of Medicine Medical Biochemistry Department Bornova, Turkey.* [2]*Ege University Faculty of Medicine Department of Surgery of General BornovaTurkey.* [3]*Ege University Faculty of Medicine Medical Biochemistry Department Bornova, Turkey*

10:00-10:15 [O1G.03]
CRISPR-Cas9 enabled digital nucleic acid detection
S. Safdar[1], S. Driesen[1], K. Ven[1], S. Eyckerman[2,3], J. Lammertyn[1], D. Spasic[1]
[1]*KU Leuven, Belgium.* [2]*Ghent University, Belgium.* [3]*VIB, Belgium*

09:15-09:30 [O2G.02]
Olfactory bulb neuronal network chip-based biosensor for long-term detection of dysosmia model in Alzheimer's disease at early-stage
M.X. Liu, F. Gao, K.Q. Gao, C.J. He, L.J. Zhuang, P. Wang
Zhejiang University, China

09:30-09:45 [O3G.03]
A novel olfactory biosensor based on 3D organoid-on-a-chip
N. Jiang, L.J. Zhuang, M.X. Liu, P. Wang
Zhejiang University, China

09:45-10:00 [O2G.04]
Microengineered Physiological Biomimicry: Human Lung-on-a-chip and the Health Applications
G.Y. Chen[1,2], J.W. Yang[3.1], K.C. Lin[3.1], S.J. Cheng[3.1], K.Y. Hsieh[3.1], S.L. Chen[3.1], C.Y. Chen[3.1]
[1]*Institute of Biomedical Engineering, College of Electrical and Computer Engineering, National Chiao Tung University, Taiwan.* [2]*Department of Biological Science and Technology, National Chiao Tung University, Taiwan.* [3]*Department of Electrical and Computer Engineering, College of Electrical and Computer Engineering, National Chiao Tung University, Taiwan*

10:00-10:15 [O2G.05]
Electrochemical biosensors for detection of bacterial virulence molecules: towards enhanced infection management
F. AlZahra'a Alatraktchi
Roskilde University, Denmark

10:15-10:30 [O2G.06]
Sensing an opportunity: insect odorant receptors are novel sensing elements for the development of next generation chemical sensors
A. Kralicek[1], R. Khadka[1], N. Aydemir[1], J. Cheema[1,2], C. Hamiaux[1], D. Colbert[1], N. Rorsman[3], D. Lunn[3], J. Travas-Sejdic[2,4], C. Carraher[1]
[1]*New Zealand Institute for Plant & Food Research Ltd, New Zealand.* [2]*University of Auckland, New Zealand.* [3]*OxSyBio, UK.* [4]*MacDiarmid Institute for Advanced Materials and Nanotechnology, New Zealand*

Adaptive in vivo device for theranostics of inflammation: real-time monitoring of cytokines and drug delivery
G.Z. Liu[1,2], C.M. Cao[2], R.H. Jin[3], Prof. X. Chen[3]
[1]*University of New South Wales, Australia.* [2]*Central China Normal University, China.* [3]*Xian Jiaotong University, China*

09:45-10:00 [O3G.02]
Electrochemistry-based ingestible sensing system for monitoring small molecular targets of alimentary canal
C. Cheng[1], L. Zhou[2], Z. An[1], G. Xu[1], Y. Lu[1], Q. Liu[1]
[1]*College of Biomedical Engineering & Instrument Scien, Zhejiang Univerisity, China.* [2]*Department of Chemistry, Zhejiang Univerisity, China*

10:00-10:15 [O3G.03]
Microneedle platforms for theranostic applications
N. Rajendran[1], O. Howells[1], C. Bolton[2], Ms. S. Asl Amini[1], Dr. G. Blayney[1],. O. Guy[1], C. Eng[3], H. Ashraf[2], S. Sharma[1]
[1]*Swansea University, UK.* [2]*SPTS Technologies, UK.* [3]*BioMEMS Technologies Ltd, UK*

10:15-10:30 [O3G.04]
Pain-free, micron-sized electrochemical continuous glucose monitoring based on open circuit potential measurement using a direct electron transfer type enzyme
I. Lee[1], N. Loew[2], J.O. Shimazaki[3], W. Tsugawa[4], K. Ikebukuro[4], J.E. Dick[1], K. Sode[3]
[1]*University of North Carolina at Chapel Hill, USA.* [2]*Tokyo University of Science, USA.* [3]*University of North Carolina at Chapel Hill and North Carolina State University, USA.* [4]*Tokyo University of Agriculture and Technology, Japan*

[1]*Catalan Institute of Nanoscience and Nanotechnology, Spain.* [2]*Universidad de los Andes, Colombia*

09:15-09:30 [O4G.02]
Development of a portable smartphone-based electrochemical biosensor for on-site detection of aflatoxins in food samples
S. Jafari[1,2], D. Migliorelli[1], L. Burr[1]M. McKeague[1], S. Generelli[1], S.J. Sturla[2]
[1]*CSEM SA, Switzerland.* [2]*ETHZ, Switzerland*

09:30-09:45 [O4G.03]
A hybrid microfluidic platform for energy harvesting based on piezoelectricity and reverse electrowetting for wearable biosensors
I. Sobianin[1], A. Tourlidakis[2], S.D. Psoma[1]
[1]*The Open University, UK.* [2]*University of Western Macedonia, Greece*

09:45-10:00 [O4G.04]
A printed potentiometric wearable sensor for sodium, potassium and pH monitoring in sweat
V. Mazzaracchio[1], S. Nappi[1], L. Fiore[1], G. Marrocco[1], F. Arduini[1,2]
[1]*University of Rome Tor Vergata, Italy.* [2]*Sense4Med srl, Italy*

10:00-10:15 [O4G.05]
Augmented reality apps for colorimetric detection with paper-based biosensors
R. de la Rica, S. Russell, A. Alba-Patiño, C. Adrover
Balearic Islands Health Research Institute, Spain

10:30-10:45 **Networking in the Lounge**

10:45-12:05 **Plenary Session 3**
Session Chairs: Arben Merkoçi & Frances Ligler

10:45-11:25 [PLN05]
Ultrasensitive label-free nanophotonic biosensors for point-of-care diagnosis
Laura M. Lechuga
Catalan Institute of Nanoscience and Nanotechnology, Spain

11:25-12:05 [PLN06]
Microengineered devices for advancing preclinical and clinical research
Nancy Allbritton
University of Washington, USA

12:05-12:30 **Networking in the Lounge**

12:30-14:00

Stream 1H - DNA- and nucleic acid-based sensors and aptasensors

Session Chairs: Benjamin Miller & Mark Platt

12:30-13:00 [KEYNOTE 1H]
Aptamers for molecular medicine
W. Tan
Hunan University, China. University of Florida, USA

13:00-13:15 [O1H.01]
Detection of circulating breast cancer cells at low concentration using optical fibers with nanoplasmonic amplification
M. Loyez[1], E. Hassan[2], M. Lobry[1], F. Liu[2], C. Caucheteur[1], R. Wattiez[1], M. DeRosa[2], W. Willmore[2], J. Albert[2]
[1]University of Mons, Belgium. [2]Carleton University, Canada

13:15-13:30 [O1H.02]
Universal electrochemical approach for real-time DNA detection based on mediator displacement loop mediated isothermal amplification (LAMP)
Z. Bagherian[1], M. Trotter[2], L. Becherer[1,2], N. Borst[1,2], F. von Stetten[1,2]
[1]IMTEK, University of Freiburg, Germany. [2]Hahn-Schickard, Germany

13:30-13:45 [O1H.03]
A novel and easily adaptable biochip format for the characterization of binding kinetics between RNA and proteins.
R.A. Higuera[1,2], L. Sperotto[3,4], M. Aziz[3,4], M. Sattler[3,4], W. Kaiser[2]
[1]Physics Department, Technical University of Munich, Germany. [2]Dynamic Biosensors GmbH, Germany. [3]Institute of Structural Biology, Helmholtz Zentrum München, Germany. [4]Biomolecular NMR, Bayerisches NMR Zentrum and Center for Integrated

Stream 2H - Immunosensors

Session Chairs: Laura Lechuga & Jing Yong Ye

12:30-12:45 [O2H.01]
Nanoparticles enhanced DigiTOF for detection of E. coli directly from urine
S. KC[1], T. Venema[2], R. Parchen[2], L.J.M. Coin[1], M.A.T. Blaskovich[1]
[1]University of Queenslad, Australia. [2]BiosparQ BV, The Netherlands

12:45-13:00 [O2H.02]
Washing-free detection of cortisol in human serum using a displacement immunosensor
P. Nandhakumar, H. Yang
Pusan National University, Republic of Korea

13:00-13:15 [O2H.03]
Wash-free immunosensing on a smartphone by controlling the movement of retroreflective Janus microparticle.
K.R. Kim, H.J. Chun, K.W. Lee, K.Y. Jeong, J-H. Kim, H.C. Yoon
Ajou Univeristy, Republic of Korea

13:15-13:30 [O2H.04]
Convenient and universal fabrication of high affinity bispecific bivalent antibody-enzyme complex as sensing element using two Catcher/Tag systems
H. Kimura[1], R. Asano[1], W. Tsugawa[1], K. Ikebukuro[1], K. Sode[2]
[1]Tokyo University of Agriculture and Technology, Japan. [2]Joint Department of Biomedical Engineering, University of North Carolina at Chapel Hill, North Carolina State University, USA

13:30-13:45 [O2H.05]
SARS-CoV-2 Humanized Antibody Detection with Immunofluorescent Paper-based Device

Stream 3H - Organism-, whole cell- and organ-based biosensors/ DNA- and nucleic acid-based sensors and aptasensors

Session Chairs: Giulio Rosati & Andrew Kralicek

12:30-12:45 [O3H.01]
Novel multilayer ultra-high-dense microelectrode arrays for high resolution bioelectronic analysis of living cells
H-G. Jahnke, S. Schmidt, R. Azendorf, A.A. Robitzki
Leipzig University, Germany

12:45-13:00 [O3H.02]
On-sensor cryopreservation for cell-based lab-on-a-chip systems
D. Özsoylu[1,2], T. Isik[3,4], M.M. Demir[4], M.J. Schöning[1], T. Wagner[1]
[1]Aachen University of Applied Sciences, Germany. [2]Dokuz Eylül University, Turkey. [3]University of Bristol, UK. [4]Izmir Institute of Technology, Turkey

13:00-13:15 [O3H.03]
Label-free bioelectronic monitoring of virus-induced alterations in functional neuronal networks
A.A. Robitzki[1], V. teKamp[2], C. Prönnecke[1], S. Schmidt[1], H-G. Jahnke[1], S. Finke[2]
[1]Leipzig University, Germany. [2]Friedrich-Loeffler-Institute, Germany

13:15-13:30 [O3H.04]
Programmable rolling circle amplification-based DNA nanoflowers for intracellular ratiometric aptasensing
N. Kim[1], E. Kim[1,2], H. Kim[1], M.R. Thomas[1], M.M. Stevens[1]
[1]Imperial College London, UK. [2]Incheon National University, Republic of Korea

Stream 4H - Smartphone diagnostics, wearable biosensors and mobile health

Session Chairs: Conor Hogan & Junko Okuda-Shimazak

12:30-12:45 [O4H.01]
An internet of things-based intensity and time-resolved fluorescence reader for point-of-care testing: application to malaria diagnosis
O. Alonso[1], N. Franch[1], J. Canals[1], K. Arias-Alpízar[2], E. de la Serna[2], E. Baldrich[2,3], A. Diéguez[1]
[1]University of Barcelona, Spain. [2]Diagnostic Nanotools Group, Molecular Biology and Biochemistry Research Center for Nanomedicine (Cibbim-Nanomedicine). Vall d'Hebron Hospital Research Institute (VHIR), Spain. [3]CIBER de Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN), Spain

12:45-13:00 [O4H.02]
Towards a rapid and dual smartphone-read diagnostic test for *Zaire* and *Sudan ebolaviruses*
D. Cherkaoui[1], P. Brangel[1], B.S. Miller[1], V. Turbe[1], Y. Chen[2], M.M. Stevens[2], R.A. McKendry[1]
[1]London Centre for Nanotechnology and Division of Medicine, University College London, , UK. [2]Department of Materials, Department of Bioengineering and Institute for Biomedical Engineering, Imperial College London,., UK

13:00-13:15 [O4H.03]
An automated and mobile magnetoresistive biosensor system for early hepatocellular carcinoma diagnosis
C. Yao, E. Ng, S.X. Wang
Stanford University, USA

Protein Science Munich at Chemistry Department, Technical University of Munich, Germany

13:45-14:00 [O1H.04]
Highly complex, surface-bound nucleic acid array libraries for protein detection, enzymatic assays and molecular encryption
J. Lietard[1], E. Schaudy[1], M. Somoza[1,2]
[1]*University of Vienna, Austria.* [2]*Technical University of Munich, Germany*

S. Kasetsirikul[1,2], M. Umer[1], N. Soda[1,3], K. R. Sreejith[1], M. J. A. Shiddiky[1,3], N. T. Nguyen[1]
[1]*Queensland Micro and Nanotechnology Centre, Griffith University, Australia.* [2]*School of Engineering and Built Environment, Griffith University, Australia.* [3]*School of Environment and Science, Griffith University, Australia*

13:30-13:45 [O3H.05]
Development of a continuous insulin sensor based on faradaic electrochemical impedance spectroscopy and redox probe-modified insulin binding aptamer
M. Khanwalker[1], J. Lee[1], J.T. LaBelle[2], C.B. Cook[3], M.R. Caplan[4], B. Morrow[2], C. Beck[2], K. Sode[1]
[1]*University of North Carolina Chapel Hill, USA.* [2]*Grand Canyon University, USA.* [3]*Mayo Clinic School of Medicine, USA.* [4]*Phoenix Country Day School, USA*

13:45-14:00 [O3H.06]
G-quadruplex based SWCNTs Nanobiosensor System for lead ions (Pb2+) Detection in Water Samples
N. Yildirim-Tirgil[1,2], H. Cho[1], H. Lee[1], A. Busnaina[1], A.Z. Gu[1,3]
[1]*Northeastern University, USA.* [2]*Ankara Yildirim Beyazit University, Turkey.* [3]*Cornell University, USA*

13:15-13:30 [O4H.04]
Integrated and miniaturized optical and electrochemical system for noninvasive monitoring of tissue oxygenation and metabolites in sweat
M. Yokus[1], T. Songkakul[1], A. Bozkurt[1], M. Daniele[1,2]
[1]*North Carolina State University, USA.* [2]*University of North Carolina at Chapel Hill, USA*

13:30-13:45 [O4H.05]
Perspective on optical biosensors: Evolutionary and current quantum leaps
F.S. Ligler
NC University and UNC--Chapel Hill, USA

14:00-15:00 **Poster Session 5**

15:00-16:30

Stream 1I - DNA- and nucleic acid-based sensors and aptasensors
Session Chairs: Dan Nicolau & Byung Chan Kim

15:00-15:30 [KEYNOTE 1I]
A paper-based point-of-care sensing platform utilizing functional nucleic acids
M. Ali, M. Liu, C. Liu, Y. Li, J. D. Brennan
McMaster University, Canada

15:30-15:45 [O1I.01]
Ultra-simple microfluidic devices for quantification of unbound and total analyte concentrations in biofluids using electrochemical aptamer based sensors
Z. Watkins, M. Friedel, J. Heikenfeld
University of Cincinnati, USA

15:45-16:00 [O1I.02]
Novel microneedle approach for coupling interstitial fluid analytes to ex-vivo affinity biosensors
M. Friedel, Z. Watkins, A. Karajic, J. Heikenfeld
Novel Devices Laboratory, University of Cincinnati, Cincinnati, Ohio, USA

16:00-16:15 [O1I.03]

Stream 2I - Printed biosensors and microfabrication
Session Chairs: Ki-Bum Lee & Maria Smolander

15:00-15:15 [O2I.01]
Biosensor solutions compatible with sustainable development
M. Smolander, L. Hakola, M. Vilkman, K. Kiri, T. Alajoki, T. Kololuoma, H. Sandberg
VTT Technical Research Centre of Finland, Finland

15:15-15:30 [O2I.02]
Chemical surface patterning by maskless Atmospheric-Pressure Plasma Printing for biosensing applications
L. Barillas[1], E. Makhneva[1], K.D. Weltmann[1], H. Seitz[2], K. Fricke[1]
[1]*Leibniz Institute for Plasma Science and Technology (INP), Germany.* [2]*University of Rostock, Germany*

15:30-15:45 [O2I.03]
Innovative stretchable screen-printed electrodes produced from green and non-petrol carbon source
D. Zappi[1,2], G. Varani[2], A. Antonacci[1], V. Scognamiglio[1], M.T. Giardi[1,2]

Stream 3I - Commercial biosensors, manufacturing and markets/Printed Biosensors
Session Chairs: Martin Peacock & Vince Siu

15:00-15:15 [O3I.01]
Current status and future perspectives of continuous glucose monitoring systems - the flagship technologies in biosensor
K. Sode
Joint Department of Biomedical Engineering, University of North Carolina at Chapel Hill and North Carolina State University, USA

15:15-15:30 [O3I.02]
Raspberry Pi based, UV-fluorescent spectrophotometer device for the analysis of oil types obtained from oil spills
M. Bills[1], A. Loh[2], K. Sosnowski[1], B. Nguyen[1], U-H. Yim[2], J-Y. Yoon[1]
[1]*University of Arizona, USA.* [2]*Korea Institute of Ocean Science & Technology, Republic of Korea*

15:30-15:45 [O3I.03]
Upscaling of microfluidic biosensor manufacturing by imprinting, printing and lamination processes on polymer foils

Stream 4I - Enzyme-based biosensors
Session Chairs: Fred Lisdat & Paolo Bollella

15:00-15:15 [O4I.01]
Ultrasensitive particle-based detection of glyphosate and other small molecules using an interferometric optical readout and biomimetic interaction principles
D. Rettke[1], J. Döring[2], S. Martin[1], T. Venus[1], I. Estrela-Lopis[1], S. Schmidt[3], K. Ostermann[2], T. Pompe[1]
[1]*Universitaet Leipzig, Germany.* [2]*Technische Universitaet Dresden, Germany.* [3]*Heinrich-Heine-Universitaet Düsseldorf, Germany*

15:15-15:30 [O4I.02]
Origami paper-based sensor for precision medicine in Alzheimer disease
V. Caratelli[1], A. Ciampaglia[1], J. Guiducci[1], D. Moscone[1], F. Arduini[1,2]
[1]*University of Rome Tor Vergata, Italy.* [2]*Sense4Med srl, Italy*

15:30-15:45 [O4I.03]
Bio-Nano-PEDOT interface: enabling conducting polymer-based biosensors via functional groups and nanostructures
L. Meng[1]A.P.F. Anthony[2], W.C. Mak[1]

	Sequence-Independent Assay for HIV Viral Load Quantitation O. El Merhebi, Y. Gerasimova, K. Chumbimuni-Torres *University of Central Florida, USA* **16:15-16:30 [O1I.04]** **Aptasensor for Homoserine Lactone Detection based on Selectively Binding Induced Impedance Changes Using Nano-Porous Anodized Alumina Membrane as Sensing Platform** N. Jiang, S. Banerjee, P. Shrotriya, M. Nilsen-Hamilton *Iowa State University, USA*	[1]*Istituto di Cristallografia, CNR, Italy.* [2]*Biosensor Srl, Formello, RM, Italy* **15:45-16:00 [O2I.04]** **Consumer or research-grade? A comparison of inkjet technologies for biosensing applications** G. Rosati[1], E. Nguyen[1], L. Zhao[1], Q. Yang[1], M. Urban[2], P. Fornasiero[2], A. Merkoçi[1] [1]*Catalan Institute of Nanoscience and Nanotechnology, Spain.* [2]*University of Trieste, Italy* **16:00-16:15 [O2I.05]** **Biosensor development for infectious disease: new technologies for measuring host biomarkers of infection and for choosing the most suitable antibiotic.** D.K. Corrigan *University of Strathclyde, UK* **16:15-16:30 [O2I.06]** **Bioinspired microfabrication of organic, flexible, and degradable biosensors** M. Xu, S. Pradhan, V.K. Yadavalli *Virginia Commonwealth University, USA*	M. Smolka[1], P. Tören[1], A. Haase[1], D.Nees[1], St. Ruttloff[1], L. Kuna[1], C. Schaude[1], M. Rumpler[1], B. Hierschläger[2], I. Katzmayr[2], M. Sonnleitner[2], M.W. Thesen[3], M. Lohse[3], W. Weigel[4], M. Strbac[5], N. Okulova[6], J. Kafka[6], J. Hesse[1], S. Resch[7], A. Falk[7] [1]*JOANNEUM RESEARCH, Austria.* [2]*GENSPEED Biotech GmbH, Austria.* [3]*micro resist technology GmbH, Germany.* [4]*Scienion AG, Germany.* [5]*TECNALIA Research & Innovation, Spain.* [6]*Inmold AS, Denmark.* [7]*BioNanoNet Forschungsgesellschaft mbH, Austria* **15:45-16:00 [O3I.04]** **An immunomagnetic chronoamperometric assay with nanomaterial modified screen-printed electrodes for point-of-site detection of marine shellfish toxin in clams** J.L.D. Nelis[1], D. Migliorelli[2], S. Jafari[2], S. Generelli[2], J. Lou-Franco[1], J.P. Salvador[3,4], M.P. Marco[3,4], C. Cao[1], C.T. Elliott[1], K. Campbell[1] [1]*Queen's University Belfast, UK.* [2]*The Swiss Center for Electronics and Microtechnology (CSEM), Switzerland.* [3]*The Spanish Council for Scientific Research (CSIC), Spain.* [4]*CIBER de Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN), Spain*	[1]*Linköping University, Sweden.* [2]*Cranfield University, UK* **15:45-16:00 [O4I.04]** **Quasi-direct electron transfer type sensing system for glycated proteins based on engineered fructosyl peptide oxidase** M. Hatada[1], S. Saito[2], W. Tsugawa[2], K. Ikebukuro[2], K. Sode[1] [1]*University of North Carolina at Chapel Hill, North Carolina State University, USA.* [2]*Tokyo University of Agriculture and Technology, Japan* **16:00-16:15 [O4I.05]** **The long term continuous glucose monitoring system employing enzyme sensor with super-stabilized engineered DET type FADGDH** J. Okuda-Shimazaki[1], H. Yoshida[2], P. Tanikella[1], Ms. I. Lee[1,3], K. Mori[4], K. Sode[1] [1]*University of North Carolina at Chapel Hill and North Carolina State University, USA.* [2]*Kagawa University, Japan.* [3]*Tokyo University of Agriculture and Technology, Japan.* [4]*Ultizyme International, Ltd, Japan* **16:15-16:30 [O4I.06]** **Design of an electroactive glucose binding protein-based biosensor through incorporation of non-natural amino acids** E. Zeynaloo[1,2], E. M. Zahran[1]Y. Yang[2,3], E. Dikici[2,3], T. Head[2,3], L. G. Bachas[1], S. Daunert[2,3] [1]*Department of Chemistry, University of Miami, USA.* [2]*Department of Biochemistry and Molecular Biology, Miller School of Medicine, University of Miami, USA.* [3]*Dr. JT Macdonald Foundation Biomedical Nanotechnology Institute, University of Miami, USA*
16:30-16:45	**Biosensors 2021** Post Prize Awards Chair: Anthony P.F. Turner			
16:45-17:15	**Closing session and announcement of Biosensors 2023** Man Bock Gu and Arben Merkoçi			